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10, E-48950 Asua-Erandio (ES).

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(74) Mandatario: CARPINTERO LOPEZ, Francisco; Her-  
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DAVID SYSTEMS TECHNOLOGY, S.L. [ES/ES]; Car-  
bonero y Sol. 30, E-28006 Madrid (ES).

(72) Inventores: e

(75) Inventores/Solicitantes (para US solamente): BLACH  
VIZOSO, Ricardo [ES/ES]; Edificio Enekuri, Pabellón  
10, E-48950 Asua-Erandio (ES). SERGEY, Timo-  
teev [RU/ES]; Edificio Enekuri, Pabellón 10, E-48950  
Asua-Erandio (ES). LYUBOV, Bobrova [RU/ES]; Edi-  
ficio Enekuri, Pabellón 10, E-48950 Asua-Erandio (ES).

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— Con informe de búsqueda internacional.

Para códigos de dos letras y otras abreviaturas, véase la sección  
"Guidance Notes on Codes and Abbreviations" que aparece al  
principio de cada número regular de la Gaceta del PCT.

(54) Title: FLUID COMPOSITION FOR PRODUCING AND REPAIRING ION EXCHANGE MEMBRANES

(54) Título: COMPOSICION FLUIDA ADECUADA PARA LA PRODUCCION Y REPARACION DE MEMBRANAS DE IN-  
TERCAMBIO IONICO(57) Abstract: Fluid composition containing ion exchange copolymer which is perfluorated with functional groups -SO<sub>3</sub>M, M-hy-  
drogen ions or ions of alkaline metals (EM higher than 900) and a polar organic solvent or a mixture of a polar organic solvent and  
a non polar solvent and, as perfluorated ion exchange copolymer, the composition contains a perfluorated ion exchange copolymer  
having a crystallinity grade from 2 to 10 % and a ratio between the density of the indicated ion exchange copolymer and the den-  
sity of the original perfluorated copolymer in non ionic form between 0.9 and 0.97. The proportion of the components is in % by  
weight: perfluorated ion exchange copolymer 1-35; polar organic solvent or mixture of polar organic solvent with non polar solvent  
65-99. Such compositions are used in the production and repair of ion exchange membranes (IEM) which are used in the alkaline  
electrolysis with chlorine or in the water electrolysis in fuel/gas separation cells.(57) Resumen: Composición fluida que contiene copolímero de intercambio iónico perfluorado con grupos funcionales -SO<sub>3</sub>M,  
iones de M-hidrógeno o iones de metales alcalinos (EM mayor de 900) y un disolvente orgánico polar o una mezcla de un disolvente  
orgánico polar y un disolvente no polar y, como copolímero de intercambio iónico perfluorado, la composición contiene un copolí-  
mero de intercambio iónico perfluorado con un grado de cristalinidad del 2 al 10 % y una relación entre la densidad del copolímero  
de intercambio iónico perfluorado original en forma no iónica de 0.90-0.97. La relación de  
los componentes es, en % en masa: copolímero de intercambio iónico perfluorado 1-35, disolvente orgánico polar o mezcla de di-  
solvente orgánico polar con disolvente no polar 65-99. Tales composiciones se usan en la producción y reparación de membranas  
de intercambio iónico (IEM), que se usan en la electrolisis alcalina con cloro en la electrolisis acuosa en celdas de separación de  
combustible y gas.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ES 99/00278

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C08L 27/18; 27/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPODOC, WPI, CIBEPAT

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US - 4453991 A (WALTHER G. GROT et al.) 12 June 1984 (12.06.84)	
A	US - 4386987 A (MICHAEL J. COVITCH) 07 June 1983 (07.06.83)	
A	EP - 0025644 A (ASAHI GLASS COMPANY LTD) 25 March 1981 (25.03.81)	

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&amp;" document member of the same patent family

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Information on patent family members

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Patent document Cited in search report	Publication date	Patent family member(s)	Publication date
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Form PCT/ISA/210 (patent family annex) (July 1992)

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Table I. Preparation conditions for the compositions. Their composition and properties.

NN	Copolymer TFE-SVE						Solvents			Solution conditions		Composition properties		
	Abbreviation	Quantity, g	Equivalent Mass	Crystallinity degree, %	Relative density	Form	Polar		Non polar	Total mass, g	Temperature °C	Time, h.	Concentration of dissolved copolymer, % in mass	Viscosity (B2-4) a
							Mass ratio							
1	SPL-2	4	2600	10	0.97	-HSO <sub>3</sub>	Isopropanol		-	196	80	4	2	8
2	SPL-1	12	1000	2	0.9	-NaSO <sub>3</sub>	Methylethylketone		-	88	20	2	12	40
3	SPL-4	8	1070	8	0.95	-KSO <sub>3</sub>	Ketone		-	92	22	3	8	38
4	SPL-4	9.3	1070	6	0.93	-KSO <sub>3</sub>	Ethanol		-	91	75	2	9.3	30
5	SPL-3	35	1100	9	0.92	-LiSO <sub>3</sub>	Dimethylformamide		-	65	80	2.5	35	450
6	SPL-5	10	1600	10	0.97	-HSO <sub>3</sub>	Dimethylformamide + Ethanol		-	90	95	2	10	51
7	SPL-1	15	1000	4	0.94	-NaSO <sub>3</sub>	Ethanol + methylethylketone	1:1	-	85	80	1.5	15	63
8	SPL-2	1	2600	10	0.97	-HSO <sub>3</sub>	Ethanol	1,1,1-Trichlorobromethane		99	80	3	1	5
9	SPL-6	7	1200	7	0.96	-HSO <sub>3</sub>	Isopropanol	Benzene		93	75	3	7	23
10	SPL-7	6	1700	7.5	0.963	-LiSO <sub>3</sub>	Isopropanol	Benzene		87	90	2	6	15
11	SPL-6 (Control)	2	1200	12	0.97	-HSO <sub>3</sub>	Isopropanol		-	198	75	3	0	-
12	SPL-6 (Control)	2	1200	10.5	0.993	-HSO <sub>3</sub>	Isopropanol		-	198	75	3	0	-